same way as I imagine the dust of the flame to be deposited on the plates, namely, by difference of temperature, our rooms being warm and windows cold at night. The only difference is in the rate of deposit, due to there being less dust in the room air and to the smaller difference in temperature in the case of the window. Cleaning a small part of a window which had been clean ten days previously, a piece of ice was rubbed over the outer surface until dew began to deposit on the inside. The deposit on the ten-day-old surface was different from the newly cleaned one, but not greatly so. While the newly cleaned part was covered with the usual little lens-like discs, the older surface was covered with much larger and irregularly shaped blotches of film. As the nights had not been cold since the window was cleaned, we can hardly expect much dust to have collected in ten days; so another window was tried which had not been cleaned for some months. Repeating the cleaning and cooling on this window, it was found that while the newly cleaned part carried a ground-glass-like deposit, the uncleaned part was sufficiently clear for the landscape to be seen through it. These tests show that dust on glass does tend to cause water condensed on its surface to spread and take the film form in the same way as glass that has been exposed to flame or to hot gases.

Coming, now, to Quincke's experiment, referred to by Lord Rayleigh, in which sulphuric acid is shown to produce the same effect as the blow-pipe flame, this and the experiment with hydrofluoric acid seem to have inclined Lord Rayleigh to think that cleanliness was the cause of the breath figures. But does either sulphuric acid or hydrofluoric acid prove cleanliness? I have doubts. I know I am on dangerous ground in differing from Lord Rayleigh on anything connected with surface action, yet I have recently had my lesson on how some substances cling to glass in spite of efforts to get rid of them, and I think it is not improbable that some residual of both sulphuric and hydrofluoric acid may cling to the glass in spite of washing. Recently I was making an investigation in which was required a little iodine vapour, and for this purpose put a small crystal of iodine in a flask from which the vapour was drawn as required. Afterwards the investigation took another turn, and the flask was used for other purposes, but many days' work were lost owing to that flask. Results were obtained with it which were contrary to previous experience. As suspicion centred on the flask it was discarded, and not until a new flask had replaced it could satisfactory work be done. Yet all this loss of time was occasioned by a residual quantity of iodine, which the washings with alcohol, acids, soap water and a sponge, had not succeeded in removing. After that experience I confess to being sceptical of absolute cleanliness of glass after being touched with sulphuric or hydrofluoric acid. Any residual of these substances, as they have an affinity for water, would tend to form films and not little lens-like patches. Though breath figures may be formed by dust, yet there are evidently other ways of altering the surface of the glass and causing it to repel or attract water, and so making the surface capable of giving breath figures.

JOHN AITKEN.

Ardenlea, Falkirk, June 5.

The "Vernal Phytoplankton Maximum."

IN NATURE for April 27 it was stated, in connection with the plankton statistics taken periodically in the Irish Sea from the Port Erin Biological Station, that (p. 289) "the outstanding fact in this season's work, so far, is that the diatoms are unusually scarce and late. The vernal phytoplankton maximum has not yet arrived."

That statement referred to the collections up to the middle of April. During the rest of April the catches remained small—for the most part 1, 2, or 3 cubic centimetres in a standard haul of the fine silk net. In May the approximate quantities (they have not yet been accurately measured), in the same net, run as follows:—

	c.c.		c.c.
May 1	2	May 22	35
,, 4	1	,, 25	10
,, 10	10	,, 29	15
,, 13	40	June 1	15
,, 16	60	,, 3	60
,, 19	50	,, 5	50

The large catches on May 13–22 were mainly composed of Chætoceras (*C. debile*, and a few other species of diatoms), while the sudden increase in the beginning of June is due almost wholly to Rhizosolenia (mainly *R. semispina*).

Last year we found that the vernal phytoplankton appeared as two well-marked maxima, one in April, caused by species of Chætoceras and Lauderia, and a second in June, composed of Rhizosolenia and Guinardia.

It is evident that the "vernal maximum" is really a complex made up of the maxima of several different species or groups of species which seem to occur in a definite sequence, but may be earlier or later, more spread out in one year or more telescoped together to form a single diatom maximum in another. Moreover, the individual species or groups of species may be more abundant one year than another.

In the present year, if we look at the three genera that usually bulk largest in our spring and early summer collections, we find that Biddulphia reached its climax in March (but continued throughout most of April in fair abundance), Chætoceras not until the latter part of May, and Rhizosolenia in early June. Rhizosolenia is usually as late as or later than this; Biddulphia is always one of the first forms to appear, sometimes causing a slight increase in the plankton as early as February, so it is really Chætoceras (some of the species of which are usually the most abundant of our April diatoms) that is this year unusually late.

I have just returned from Port Erin, where, during the first few days of this month, Rhizosolenia seemed to be unusually abundant. The water of the bay is visibly discoloured by it; when a tow-net at the end of a fifteen minutes' haul is raised from the sea it contains a column of thick soupy fluid, which runs out very slowly, as the meshes of the silk are largely clogged up with the diatoms; on a calm surface, with the sun shining, the peculiar iridescent glistening appearance characteristic of Rhizosolenia can be seen from the boat, and anything put into the water is at once covered by a slimy layer of the slender needles. It may be that Rhizosolenia has not even yet attained its climax, but a week ago the June increase in diatoms had certainly set in with unusual force. The "vernal maximum" has, then, this year been spread out and divided into three parts—a slighter increase in March (Biddulphia), a much greater one, later than usual, in May (Chætoceras), and another great increase (Rhizosolenia) early in June.

W. A. HERDMAN.

Liverpool, June 10.

On the Action of the Latex of *Euphorbia peplus* on a Photographic Plate.

IN August, 1909, our attention was directed to certain properties of surgical importance possessed by the milky juice of *Euphorbia peplus*, a spurge naturalised in this colony. During the examination of the milky juice or latex, we exposed during two days in the dark a highly sensitive photographic plate some millimetres above a sheet of glass on which we had dried a few drops of the juice. On development, a sharp image of the dried juice appeared on the plate. We propose to describe briefly a few results from the many experiments since made to determine the conditions and nature of the action on the photographic plate.

Thirty drops of the juice were spread on a sheet of glass as the letters EUPHORBIA, and the glass dried in an oven at 100° C. for two hours. A sharply defined image of the letters was produced on development of a photographic plate (speed 325) placed 5 mm. above the dried juice after an exposure of forty-eight hours or longer. The density of the images increased with greater length of exposure, with thicker films of dried juice, and with less distance between the plate and the film. The edges of the images were well defined, as if focussed on the photographic plate. No image appeared with short exposures of twenty-four to forty-eight hours unless the films were very thick. With long exposures, up to thirty days, the images were more dense, but showed a little diffusion at the edges of the letters. When a distance of 15 mm. separated the photographic plate from the film, the plate was unaffected. Action on the plate diminished

rapidly when the distance from the film exceeded 5 mm. The dried juice retained the action with undiminished effect for months. When the dried films were heated from 150° C. to 200° C. they charred, but did not lose their action on the plate. As the temperature was raised further the power of affecting the plates was diminished, as the ash of the juice became white. Even the white ash had a slight action on the plate (potassium salts).

The introduction of screens between the film and the photographic plate led to notable results. The interposition of tissue paper slightly delayed the action on the photographic plate. Thick black paper (0·13 mm.) employed by the makers to enclose photographic plates, and found by us impenetrable to the rays from phosphorescent salts, served only to delay the time in which an image of a definite intensity was formed. The effect was produced through a celluloid screen (0·07 mm.) and through paraffined paper (0·03 mm.). We were unable to obtain screens of glass or mica less than 0·02 mm. in thickness. These screens completely protected the plates from action by the film. Screens of aluminium foil 0·002 mm. thick made no alteration in the intensity of the image of the film. When eight layers of the aluminium foil were superimposed, the density of the image on the plate was increased.

Examination of the dried material with a zinc sulphide screen failed to show any scintillations due to the α particles.

When a rapid current of dried air was passed obliquely between the plate and the film at a rate of 300 c.c. per minute the image of the letters on the film was sharp and well defined. The distance between the plate and the film was 0·5 mm. Any gas or emanation would have been carried along by the current, especially any gas having such a slow action on a photographic plate.

H. G. CHAPMAN.
University of Sydney, May 3. J. M. PETRIE.

Musical Sands of Eigg.

SINCE Hugh Miller's brief reference ("The Cruise of the *Betsey*") to the musical sands of the Bay of Laig, Isle of Eigg, much has been done with these, and sands of a similar character, to enable us to account for the cause of the phenomenon; and the interest taken by physicists in certain experiments which I conducted some years ago induces me to offer the results of some further observations for publication.

There is no musical sand in the Bay of Laig, and, so far as I can ascertain, its sands have never been musical within the memory of any inhabitant of the island. At the present time the psammological conditions are such as to preclude entirely the possibility of its existence there.

In a small bay—about a mile and a half along the shore to the north of Laig Bay—known as Camas Sgiotaig, musical sands occur. This bay is divided into two portions by a reef of calcareous sandstone jutting out from the cliffs seawards. In both portions, but especially close to the cliffs, a white quartzose sand has accumulated, and this is the only place where musical sands are found in Eigg.

The sands are derived from the waste of the calcareous sandstone referred to. In places the grains have accumulated in small rifts and cavities in the rocks, and in all such it was found to be equally musical, showing that long, flat stretches of sand are not essential conditions for the selective action of the winds and sea-waves.

The usual experiments with various vessels and plungers, &c., were carried out *in situ*, and the musical effects were in all cases much more pronounced than those produced by the Studland Bay sand.

An extraordinary volume of sound was obtained by dragging the convex part of a wooden bowl along the surface of the sand patches, one of which was only about 6 feet square. When the same bowl was partially filled, and the sand struck with a wooden plunger, it emitted a noise like the deep bark of a dog, and this could be heard for a considerable distance along the shore.

These musical sands are only found in calm weather; in the winter the huge waves carry away all fine matter, and only the rocks remain—for which reason we must regard it as a fine-weather phenomenon in this island.

Eigg, June 6. CECIL CARUS-WILSON.

P.S.—Since the posting of my letter respecting the musical sands of Eigg, I have read the letter from Mr. Thomas which appeared in NATURE of June 8.

Prof. Poynting, I think, informed me of the occurrence of these sands at Barmouth some time ago, and I have found them also at Penally, near Tenby, at Longland Bay, and in Swansea Bay.

I have frequently pointed out that the pitch of the notes emitted from musical sands depends (*a*) upon the size of the grain, (*b*) the area of the plunger's striking surface, and (*c*) the form and composition of the vessel used. In some vessels of particular form I have succeeded in producing from the same mass of sand, and during the one thrust of the plunger, notes of both high and low pitch!

The vessel containing the sand is first well shaken in order that the smaller grains may settle at the bottom of the mass and the larger ones at the top. The plunger is then thrust sharply upon the surface, and coming first in contact with the larger grains, it produces a low note; this merges into a note of higher pitch as the plunger penetrates the mass and reaches the finer grains at the bottom of the vessel.

As a matter of fact, the notes from all natural musical sands appear to be a cumulative effect due to a combination of high and low pitch within a given range. The only sand which seems to emit a pure and definite note is that which I have produced artificially.

June 10. C. C.-W.

Botanical Research in Ceylon.

THE letter from Cambridge with the above title, which appeared in your issue of May 25, has evidently been written without knowledge of the difficulties which have arisen at Peradeniya within the last few years and under a complete misapprehension of my views.

The letter reproduces, without the context, a single sentence from a memorandum of mine. In this memorandum special stress is laid on the importance of maintaining Peradeniya as a centre of botanical research, and it is suggested that Dr. Willis should remain as its director under such conditions as would allow of his conducting botanical investigations which in recent years he has found it impossible to undertake.

The letter seeks chiefly to justify Dr. Willis's position as a botanist, which has not been called in question. Neither have the services which Peradeniya has rendered to the botanical workers who have visited it been questioned.

The sentence quoted from my memorandum refers to the two principal members of the staff and the difficulties which admittedly have rendered botanical research impossible for them owing to the pressure of other work.

My suggestion, as a solution of the difficulties which have arisen, was to maintain Peradeniya "as a great reference garden and centre for botanical research in the tropics"—to reproduce my own words—distinct from, though cooperating with, the Agricultural Department which the Government of Ceylon, most wisely, now desires to establish. Whilst I should have preferred this solution, I am satisfied that the decision to incorporate the Royal Botanic Gardens at Peradeniya with the Agricultural Department will secure what the colony chiefly needs in the interests of tropical agriculture, for the advancement of which the whole community, European and native, is so deeply concerned.

WYNDHAM R. DUNSTAN.

June 3.

The Extinction of the Egret.

IT will be remembered by those who are interested in the protection of the white heron that the feather dealers have urged that the breeding haunts, or garzeros, of these birds are guarded, and that the moulted feathers are picked up from the ground. From information which has been sent to me from the National Association of Audubon Societies, based on the sworn testimony of a man who